



The Droplet

Florida Water Environment Association
Integrated Water Resources Committee

September 2011

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Committee News & Information

The FWEA Integrated Water Resources Committee held its elections earlier this year and below is the list of our 2011-2012 officers.

Chair: Leslie Turner

Secretary: Gabe Retana

Treasurer: Leslie Gowdish

Website Chair: Susan Gerena

Newsletter Chair: Saurabh Srivastava

Seminar Chair: Leslie Turner

Past Chair: Liz Bartell

Our new chair, Leslie Turner, has been a member of the IWRC since 2007 and has previously served as the vice chair and newsletter chair. We thank Liz Bartell for all her efforts and hard work as the chair during the last fiscal year.

As the new chairs get to work, we have another exciting year ahead of us. We are already planning for full day seminar to be held in early 2012. Details of these seminars will be announced in the newsletter as they are finalized, so keep reading!

We are always looking for feedback from our readers regarding topics that are of interest to you, topics that you would like to be discussed in the newsletter in an upcoming issue or any general comment about the newsletter. Please email us your thoughts on the newsletter. To become an official sponsor of *The Droplet* or to consider becoming a member of the IWRC, please visit our website at <http://www.fwea.org/> or email Saurabh Srivastava at Srivastava@pbworld.com.

Chair:
Leslie Turner

Vice Chair:
[Vacant]

Secretary:
Gabriel Retana

Treasurer:
Leslie Gowdish

The Geographic Information System in Transient Groundwater Flow Modeling

Development of a transient groundwater flow model on a regional scale requires the management of a significant amount of data. Typically, regional groundwater modeling requires the study area be subdivided into a large number of cells. Each cell is then assigned qualitative and quantitative attributes that define the hydraulic characteristics of the system in space and time. As stated by Richards et al. (1993), "Managing the data, assembling model input files, and analyzing the model results is typically a complicated, cumbersome, time consuming process which includes many opportunities for data entry or data management errors." Integrating the Geographic Information System (GIS) in transient groundwater flow modeling significantly improves the analysis of data. It enhances the reliability of the analysis by automating processes that generate input files and/or graphic outputs. The GIS reduces the number of manual steps necessary to set up the model; therefore, minimizing the opportunities for management errors. This article highlights some of the benefits of using the GIS as a tool to manipulate, store, query, and retrieve data associated with regional transient groundwater flow modeling efforts. This article is a brief excerpt from the information presented by Vera (2010).

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The GIS can be used to generate input files and output graphics readily, saving time and minimizing the risk for errors. The GIS possesses the ability to identify, select and extract spatially referenced data (e.g., wells, recharge components, aquifer parameters, etc.) readily for the study area to support the development of transient models. The GIS also provides the modeler with an opportunity to expedite generation of groundwater flow model input files through pre-processing. Pre-processing can be achieved by embedding codes directly into the GIS which allows a rapid conversion of spatially referenced data into groundwater flow models (e.g., MODFLOW) input files. Visualizing user interfaces (e.g., GMS®, Groundwater Vistas®, etc.) output data in the GIS either by color-filling techniques or through the use of contour lines assists the modeler/viewer to analyze the results of the model in time and in space.

Generating output graphics using the GIS provides a better regional perspective of the distribution of anticipated water level and groundwater flow changes in the study area resulting from changes in pumping and recharge conditions within the simulation period. The GIS provides the ability to identify potential areas of concern (highest drawdown), the efficiency of aquifer recharge projects (water level rise), and the proximity of these areas to key locations such as wellfields, residential areas, water bodies, roads, etc. The GIS also provides an effective platform to store large amount of transient and spatially referenced data for easy access and distribution. Also, the GIS is proven to be an effective tool for the design of groundwater level and groundwater quality monitoring networks resulting from the modeling efforts by allowing model results to be displayed on top of surface water feature coverages such as wetlands or lakes. Finally, the GIS can be used to estimate the depth at which data loggers should be appropriately installed in monitoring wells to ensure reliability and continuity of the data logging.

References:

Richards, C. J., H. Roaza, and R. M. Roaza, 1993. Integrating Geographic Information Systems and MODFLOW for Ground Water Resource Assessments. *Water Resources Bulletin* 29(5): 847-853.

Vera, O., 2010. Application of GIS on a Regional Transient Groundwater Flow Model. *Proceedings of AWRA 2010 Spring Specialty Conference*. March 29-31, 2010. Orlando, FL.

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Upcoming FWEA Events

SEP 29 - West Coast Chapter Annual Roundtable Lunch

SEP 30 - Southwest Chapter Golf Tournament

OCT 7 - Treasure Coast Golf Tournament

OCT 22 - Florida Water Festival

OCT 26 - Biosolids Management Seminar

OCT 31 Florida Benchmarking Seminar

DEC 6 - Big Bend Winter Seminar

For more information of any of the above events, please visit www.fwea.org



Calendar of Events

<u>Date</u>	<u>Description</u>
October 4, 2011	IWRC Meeting Teleconference
November 8, 2011	IWRC Meeting Teleconference
December 6, 2011	IWRC Meeting Teleconference
January 10, 2011	IWRC Meeting Teleconference

UF Water Institute
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**Sustainable
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Complex Challenges, Integrated Solutions

Nutrient Dynamics, Policy and Management in Watersheds

The 3rd Biennial UF Water Institute Symposium
February 15-16, 2012

J. Wayne Reitz Union, University of Florida Campus, Gainesville, Florida

Join us to explore complex, emerging issues related to nutrient sources, dynamics, management and policy from multiple perspectives.

Dates of Interest:

*Call for Abstracts - August 16, 2011

*Abstract submission Deadline - October 10, 2011

For sponsorship opportunities contact:
Lisette Staal, lstaal@ufl.edu

For more information go to:
<http://waterinstitute.ufl.edu/symposium2012/>

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